

TROPIDONOTUS MAIRII VS BUFO MARINUS: — *Bufo marinus* was released in sugar-growing districts of eastern Queensland in 1935–6 and now occurs widely in that State and in northeast New South Wales. It is a highly toxic species (Meyer and Linde, 1971, p.522). The bulk of the venom is contained in the parotid glands. Venom is also secreted by smaller glands that cover the whole animal and toxins have been identified in other parts of the body, e.g. blood and ovaries (Meyer and Linde, 1971). The eggs also contain toxins (Licht, 1967) and, although there are no data on toxicity of the larvae, it does not seem unreasonable to assume they are also toxic.

Several native vertebrates can utilise *B. marinus* as a food source by eating eggs, larvae, newly metamorphosed young (e.g. Jungle Perch, *Kuhlia rupestris*; Snapping Turtle, *Elseyia latisternum*; Green Tree Snake, *Dendrelaphis punctulatus*; Common Keelback, *Tropidonotus mairii*) and selected body organs (e.g. Crow, *Corvus* sp.; Swamp Hen, *Porphyrio porphyrio*; White Ibis, *Threskiornis mollucca*; Water Rat, *Hydromys chrysogaster*); or by 'washing' adults prior to ingestion (captive Estuarine Crocodiles, *Crocodylus porosus* have been observed washing *B. marinus* by shaking them vigorously in water for several minutes prior to successful ingestion) (Covacevich and Archer, 1975; Hamley and Georges, 1985; G. Ingram, pers. obs.).

Australian frog-eating snakes are known to be particularly susceptible to the toxin of *B. marinus* with one exception. This species the Common Keelback Snake (*Tropidonotus mairii*) has been regarded as the most successful and only regular native predator of *B. marinus*. It is known to consume large numbers of eggs, larvae, and newly metamorphosed young (Lyon, 1973; Covacevich and Archer, 1975; C. Tanner pers. comm.). *T. mairii*, a colubrid snake (subfamily Natricinae), is closely related to other natricine species occurring in North and South America, Asia and Europe (Malnate, 1960) where *Bufo* spp. also occur naturally. Its apparent high tolerance of *Bufo marinus* venom was attributed to the long evolutionary association of natricines and bufonids in these areas.

In December, 1976 a dead specimen of *Tropidonotus mairii* (total length 85cm) with a young adult *Bufo marinus* (head width 2.5 cm), one third ingested from the vent (rather than the head as is usual with snakes), was found in the dry

bed of Richter's Creek, 10km north of Cairns, NEQ (Queensland Museum registration no. J 28417). There were no marks on the snake to suggest death from an encounter with a possible predator, and the toad is no larger than other frogs or small mammals commonly consumed by snakes of comparable size. Death from toad toxin is the only apparent explanation.

The discovery of this single known unsuccessful encounter between *T. mairii* and *B. marinus* is not conclusive evidence that larger *B. marinus* are invariably toxic to *T. mairii*, but this species is apparently more susceptible to *B. marinus* toxins than was supposed, particularly because in the case reported here, the snake had begun to ingest the toad from the rear, thus avoiding toxin concentrations in the parotid glands immediately behind the head.

Literature Cited

- Covacevich, J and Archer, M. 1975. The distribution of the Cane Toad, *Bufo marinus*, in Australia and its effects on indigenous vertebrates. *Memoirs of the Queensland Museum* 17(2): 305-10, pl.41.
- Hamley, T. and Georges, A. 1985. The Australian snapping tortoise *Elseyia latisternum*: a successful predator on the introduced cane toad. *Australian Zoologist* 21: 607-610.
- Licht, L.E. 1967. Death following possible ingestion of toad eggs. *Toxicon* 5: 141-2.
- Lyon, B. 1973. Observations on the Common Keelback Snake, *Natrix mairii*, in Brisbane, south-eastern Queensland. *Herpetofauna* 6(1): 2-5.
- Malnate, E.V. 1960. Systematic division and evolution of the colubrid snake genus *Natrix*, with comments on the subfamily Natricinae. *Proc. Acad. Nat. Sci. Philad.* 112(3): 41-71.
- Meyer, K. and Linde, H. 1971. Collections of toad venoms and chemistry of the toad venom steroids. pp. In Bucherl, W. and Buckley, E.E. (eds), 'Venomous Animals and their Venoms'. Vol. 2. (Academic Press: New York).

G.J. Ingram and J. Covacevich, *Queensland Museum, PO Box 300, South Brisbane, Queensland 4101, Australia; 16 August, 1990.*